



A Changing Arctic: An Urgent Call For Collaborative And Cooperative Action

3rd Symposium on the Impacts of an Ice-diminishing Arctic on Naval & Maritime Operations

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A Changing Arctic

Atmosphere

Sea Ice

Ocean

Land

Biology



Domestic & International Context

UNCLOS

Sea Ice Extent

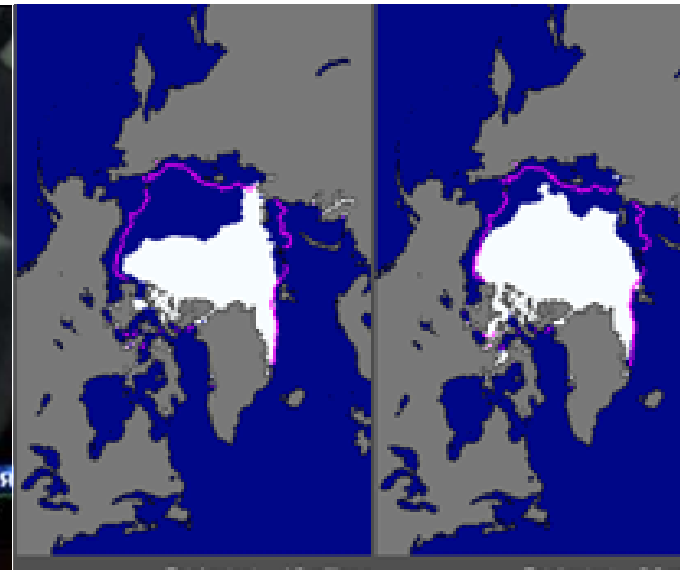
Polar Bear and ESA

NSPD 66/HSPD 25

North Pacific Fisheries Management Council

House Arctic Protections Letter

Russian Security Council Announcement



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A National Challenge

Challenge:

Critical environmental, economic, and national security issues are emerging

The Nation needs:

Science-based information and baselines necessary for understanding and evaluating climate change and its impacts

Expansion of critical NOAA services in the Arctic region



Climate Science & Services

Understanding relative contributions of natural climate variability and anthropogenic forcing

Impacts of lower latitude activities on the Arctic climate

Region's role overall in global climate change and ecosystem impacts

Potential actions to prevent or mitigate climate changes in the Arctic and globally



Coastal Community Hazard Resilience

**Manage Coastal
Resources**

**Protect Community &
Ecosystem Health**

**Sustain Indigenous
Cultures**



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Weather & Water Services

**More Frequent &
More Accurate
Information**

**Better Forecast &
Warning Capability**

Sea Ice Forecasts



Ocean Acidification

Marine Navigation & Homeland Security

Provide essential tools for safe navigation

Improved support of fleet and aircraft assets

Prepare for expanded oil spill response and restoration needs



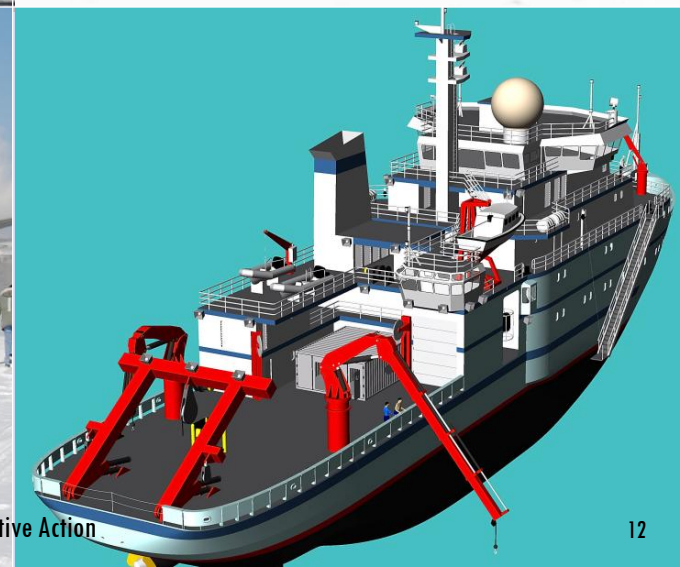
Arctic-Capable Research Platforms

**NOAA's aircraft operate in
the Arctic**

**Testing of Unmanned
Aircraft Systems is ongoing**

**NOAA's ship fleet has
limited capability to
operate in ice**

**Alaska Regional Research
Vessel**

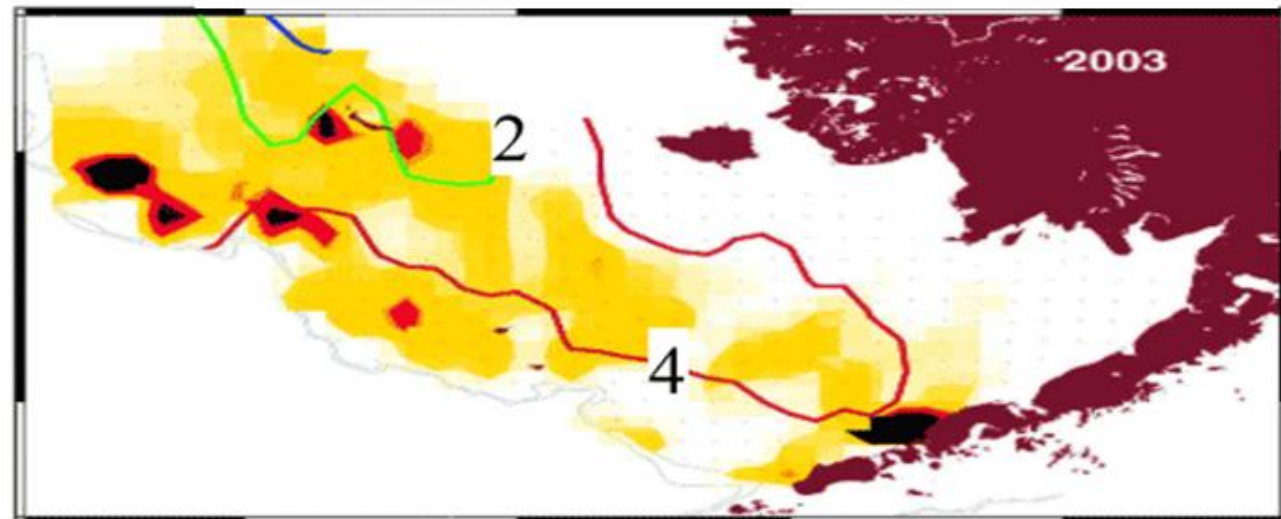
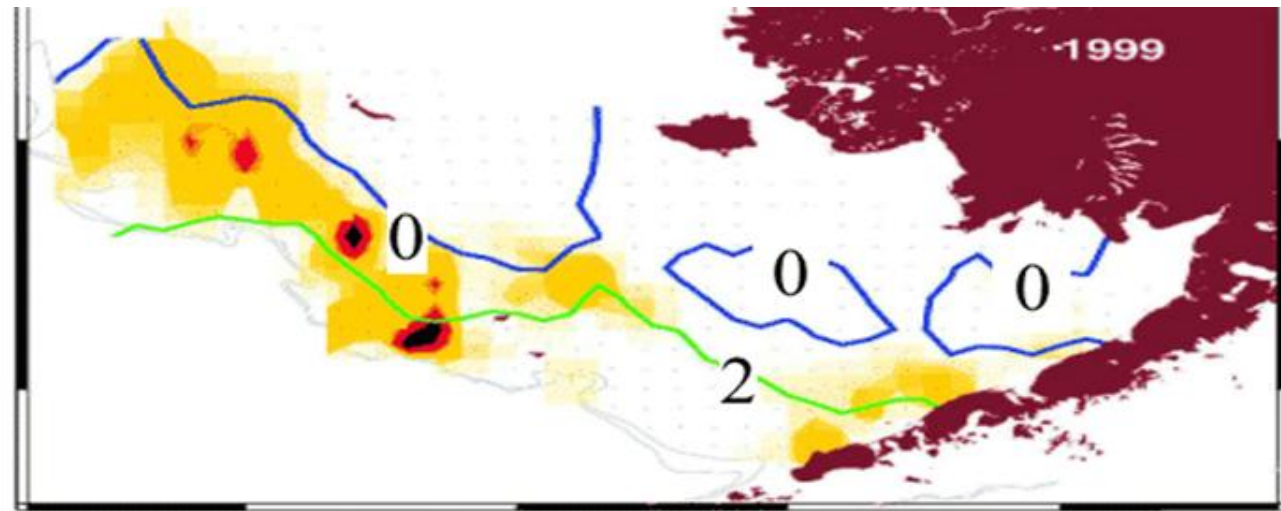


Marine Ecosystems & Resource Management

**Ecosystems & Associated
Resources Remain Poorly
Understood**

**Climate Change Impacts
Put Living Marine
Resources in Flux**

**Preparation for Changed
Arctic Required**



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Arctic Governance & International Cooperation

**International Partnerships
Critical**

**Convention on the Law of
the Sea**

Extended Continental Shelf

Maritime jurisdiction and boundaries in the Arctic region

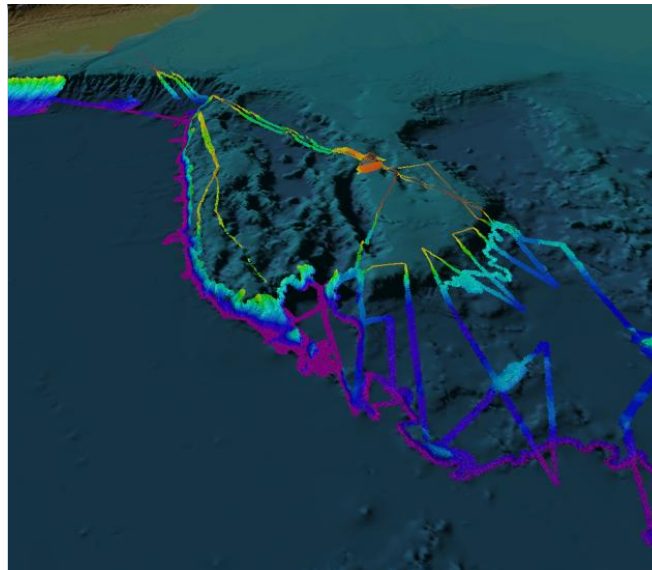


The Way Forward

Greater investment in regional observations and supporting infrastructure

Scientific exploration, research, modeling, and predictions

Technology and data management





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